UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/637,821	08/11/2000	Keith O. Johnson	PACIF-55288	7950

22801 7590 02/23/2004

LEE & HAYES PLLC
421 W RIVERSIDE AVENUE SUITE 500
SPOKANE, WA 99201

EXAMINER	
MICHALSKI, JUSTIN I	

ART UNIT	PAPER NUMBER
2644	16

DATE MAILED: 02/23/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/637,821	JOHNSON ET AL.	
	Examiner	Art Unit	
	Justin Michalski	2644	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 12/17/2003.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-54 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-54 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. Rejection of Claims 2-12, 14-28, 30-36, 38-44, and 46-54 stand as in Office Action Paper No. 13.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claim 1 is rejected under 35 U.S.C. 102(e) as being anticipated by Yashima et al. (US Patent 5,953,431). Yashima et al. discloses an apparatus for modifying an electrical audio signal (Fig. 4) for input to a sonic reproduction device (references 3, 4, 200, and 300) that includes a speaker (references 4, 200, and 300) characterized by a plurality of individual responses which in combination define an overall response for the sonic reproduction device (references 102, 103, 202, and 104), each individual response comprising at least one of a frequency, time, phase or transient response (Yashima discloses individual responses consist of frequency response) (Column 1, lines 18-21), said apparatus comprising: a plurality of modification filters having modification responses that simulate the plurality of individual responses (references 102, 103, 202, 104, 203, and 2), at least one said modification filter (filter 102)

simulating an individual component of the speaker (component 4), the modification filters for receiving the electrical audio signal (reference 1), modifying the electrical audio signal and providing the electrical audio signal to the sonic reproduction device (references 4, 200, and 300); and a plurality of adjustable parameters (references 4, 200, and 300 can be changed therefore adjusting parameters), each associated with at least one of the modification filters for allowing adjustments to the responses of the modification filters (references 4, 200, and 300 relate to filters 102, 103, and 202 respectively); wherein the adjustments create a plurality of individual conjugate responses, each individual conjugate response associated with at least one of the plurality of individual responses (Yashima et al. discloses references 102, 103, and 202 are inverse characteristics of their respective responses) (Column 10, lines 56-66).

4. Claims 29, 37, and 45 are rejected under 35 U.S.C. 102(e) as being anticipated by Narasimhan et al. (US Patent 6,252,968).

Regarding Claim 29 Narasimhan et al. discloses a sonic reproduction device having associated mechanical, acoustic and electromagnetic behavioral characteristics (reproduction medium 300); a source for outputting an electrical audio signal to a model of the sonic reproduction device (source 140), the model having a plurality of filters (Narasimhan et al. discloses M number of sub-bands (i.e. filters) (Column 3, lines 23-32)) that simulate at least one of the mechanical, acoustic and electromagnetic behavioral characteristics of the sonic reproduction device, at least one said filter simulating an individual component of a speaker of the sonic reproduction device (filters

simulate an individual sub-band frequency component of the speaker of the sonic reproduction device) (Column 2, lines 41-51), each filter having an associated response comprising at least one of a frequency, time, phase or transient response (filters relate to frequency response of device) (Column 2, lines 41-51), the model outputting the electrical audio signal to the sonic reproduction device (reproduction medium 300); and a controller (Computer 110) that modifies the responses of the filter to transform the model into a conjugate model having a plurality of filters (filters 220) with responses that comprise conjugates to the original response of the filter.

Regarding Claim 37, Narasimhan et al. discloses a method for modifying an electrical audio signal (source 140) for input to a sonic reproduction device (device 300) having a speaker (Figure 1, speakers 120) characterized by a plurality of individual responses (sub-band filters 220) which in combination define an overall response for the sonic reproduction device, each individual response comprising at least one of a frequency, time, phase, or transient response comprising steps of (filters represent frequency response)(Column 2, lines 41-51): simulating the plurality of individual responses with a plurality of filters (M sub-bands) (Column 3, lines 22-33), at least one said filter simulates an individual component of a speaker of the speaker (filters simulate an individual sub-band frequency component of the speaker) (Column 2, lines 41-51); adjusting the responses of the plurality of filters such that, for each filter, the adjusted response comprises a response that is a conjugate to one of the individual responses (sub-band inverse filter 220); and inputting the electrical audio signal to the filters (output of 140 to 200).

Regarding Claim 45, Narasimhan et al. further discloses a method of altering an electrical audio signal for input to a sonic reproduction device (device 300) having a speaker (Figure 1, speakers 120) and associated behavioral characteristics, said method comprising the steps of: simulating at least one of the behavioral characteristics of the sonic reproduction device with a plurality of filters (Narasimhan et al. discloses M number of sub-bands (i.e. filters) (Column 3, lines 23-32)), at least one said filter simulates an individual component of a speaker of the speaker (filters simulate an individual sub-band frequency component of the speaker) (Column 2, lines 41-51), each filter having an associated response comprising at least one of a frequency, time, phase or transient response (filters represent frequency response) (Column 2, lines 41-51); and for each of the filters, modifying the response of the filter to transform the filter into a conjugate filter having a response that comprises a conjugate to the original response of the filter (sub-band inverse filters 220).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yashima et al. (US Patent 5,953,431) in view of Narasimhan et al. (US Patent 6,252,968).

Regarding Claim 13, Yashima et al. discloses a sound compensation system (Figure 4) for altering an electrical audio signal for input (reference 1) to a sonic reproduction device (references 3, 4, 200, and 300) including a speaker (references 4, 200, and 300) having associated behavioral characteristics, said system comprising a model of the sonic reproduction device having a plurality of filters (references 102, 103, and 202) that simulate at least one of the behavioral characteristics of the sonic reproduction device (reference 102, 103, and 202 simulate reference 4, 20, and 300 respectively of the sonic reproduction device) (column 10 , lines 52-66), each filter having an associated response that combine to define an overall response for the model, at least one said filter (filter 102) simulating an individual component of the speaker (component 4) each response comprising at least one of a frequency, time, phase or transient response (Yashima et al. discloses responses being frequency response) (Column 1, lines 18-21). Yashima et al. does not disclose a controller that modifies the response of the filters. Narasimhan et al. discloses a controller (Computer 110) that modifies the response of each of the plurality of filters to transform the filter into a conjugate filter (filters 220) having a response that is a conjugate to the original response of the filter (Column 3, lines 21-48). Both Yashima et al. and Narasimhan et al. rely on a method of applying a set of inverse filters based on characteristics of a sonic reproduction device. Yashima et al. discloses providing an acoustic replay device with which the sound radiated by the opening of the ducted horn acting as the sound source has a characteristic which is not inferior to the characteristic of the speaker itself (Column 4, lines 56-61). Narasimhan et al. discloses the advantage of inverse filtering

to better match the audio signal to the intended audio output (Column 2, lines 48-50). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the method of inverse feedback as taught by Narasimhan et al. and Yashima et al. with the method of modeling the individual components in order to obtain a higher fidelity audio output from a sonic reproduction device by accounting for the characteristics of the speaker and physical components of the sound source and sonic reproduction device.

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Justin Michalski whose telephone number is (703)305-5598. The examiner can normally be reached on 8 Hours, 5 day/week.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bill Isen can be reached on (703)305-4386. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JIM

XU MEI
PRIMARY EXAMINER